INDEX OF AUTHORS

Abelson, Philip H., 401
Ajl, Samuel J., 393
Alberts, J. O., 139
Aldous, Elaine, 401
Andrews, E. Anne, 215
Angulo, Juan J., 129

Bailey, John Hays, 269
Barker, H. A., 349
Beardmore, William B., 5
Beisel, C. Gordon, 119
Bernheim, Frederick, 767
Beutner, Ernst H., 635, 641
Billen, Daniel, 311
Bolton, Ellis T., 233
Brandly, C. A., 557
Braun, Werner, 283, 291, 366
Braxton, Thelma, 119
Brough, Franklin K., 365
Brown, Albert L., 673
Brown, Claude P., 1
Buettner, L. G., 481

Cavallito, Chester J., 269
Christman, John F., 107
Clifton, C. E., 113, 573, 585
Cohen, Seymour S., 69
Cole, Leonard J., 283
Collins, E. B., 533
Cowie, Dean B., 233

Dagley, S., 369
Dalldorf, Gilbert, 175
Davis, Bernard D., 17, 507, 733
Dawes, E. A., 369
DeLamater, Edward D., 321
Delwiche, Eugene A., 757
Dodd, Matt C., 5
Douglas, Howard C., 9
Dunn, Cecil G., 263

Eagle, Harry, 57
Eisenstark, A., 525
Emerson, Sterling, 221
English, Jack D., 101
Evans, James B., 481
Ewing, William H., 367

Fabricant, Catherine, 423
Flanders, Thelma, 681
Fram, Harvey, 263

Garber, E. D., 508
Gerhardt, Philipp, 459
Goodlow, Robert J., 291
Grady, Robert P., 509
Graham, Fredrick, 171
Greenberg, Bernard G., 473
Greenspan, George, 29
Grimm, Madelon R., 145
György, Paul, 681

Hanel, Everett, Jr., 104
Hansen, P. Arne, 543
Hanson, R. P., 557
Harrison, Arthur P., Jr., 543
Henig, E., 213
Henriksen, Sverre Dick, 225
Hillier, James, 423, 635, 641
Hirsch, W., 101, 213
Housewright, Riley D., 89
Howell, E. Virgil, 366
Hucks, Martha C., 367
Hunt, Andrew D., Jr., 159
Hunter, Mary Elizabeth, 315

James, A. P., 719
Johnson, Frank H., 279

Kallio, R. E., 607
Kimler, Alexander, 469
Kitay, Estelle, 49
Klein, Morton, 159
Kligman, Albert M., 415
Kline, Leo, 349
Knaysi, Georges, 423
Knox, Grace A., 301
Koerber, Walter L., 29
Kutsky, R. J., 763
Kyle, T. S., 525

Labaw, Louis W., 511
Lamanna, Carl, 499
Langlykke, A. F., 29
Lankford, C. E., 655
Lederberg, Joshua, 381
Lee, A. M., 677
Leifson, Einar, 678
Lein, Joseph, 185
Lein, Patricia S., 185
Levine, H. B., 459, 508
Levine, Seymour, 333, 341
Lichstein, Herman C., 107, 311, 485
Lofgren, Ruth, 617

Maas, Werner K., 733
Magnuson, Harold J., 473
Mallette, M. F., 499
Mandel, Manley, 660
Mandels, G. R., 249
Mandia, James W., 275
Mescon, Herbert, 415
Mika, Leonard A., 291
Mingioli, Elizabeth S., 17
Moat, A. G., 757
Morrison, G. A., 369
Mosley, Vernon M., 511
Mudd, Stuart, 315, 635, 641

Nelson, F. E., 533
Niven, C. F., Jr., 481
Norris, Robert F., 681
Novak, Milan, 333, 341

Oglesby, Glenda, 655, 661
O'Kane, D. J., 449
Olarte, Jorge, 129
Oppenheimer, Carl H., 771
Osborne, Joel T., 119

Parmelee, C. E., 533
Peterson, W. H., 39
Phillips, G. Briggs, 104
Plough, H. H., 145
Porter, J. R., 607
Prier, J. E., 139
Proctor, Bernard E., 263

Raff, Ruth N., 69
Randles, Chester I., 627
Rawlins, T. E., 763
Rittenberg, Sydney C., 509
Rode, L. J., 655, 661

Sands, Margot K., 233
Sapiro, R., 101, 213
Schmidt, Clarence F., 205
Schorr, Sonia E., 159
Schubardt, V. T., 655, 661
Shaw, Myrtle, 175
Shuman, R. D., 677
Siegel, Benjamin V., 113, 573, 585
Siegel, Jack M., 595
Sisler, Frederick D., 747
Siu, R. G. H., 249
Slade, Hutton D., 301
Smith, Andrew G., 635, 641
Smith, Louis DeSpain, 9
Snell, Esmond E., 49
Starr, Mortimer P., 669
Steinman, Harry G., 57
Stempen, Henry, 81
Sugg, John Y., 489

Tabachnick, Joseph, 119
Tashman, Sylvia, 159
Thoma, Richard W., 39
Thompson, Frederick A., Jr., 473
Thorne, Curtis B., 89
Tomarelli, R. M., 681

Upton, Elizabeth, 557

Vaughn, Reese H., 119

Warbasse, Warren W., 279
Ward, C. B., Jr., 525
Warren, John R., 171
Watson, James Dewey, 607
Watson, John H. L., 129
Wedding, George T., 119
Williams, O. B., 101
Williams, Virginia R., 215
Wilson, J. B., 459
Winslow, Nancy S., 557
Won, William D., 102
Woodburn, Marcia A., 315
Wyckoff, Ralph W. G., 511

Youmans, Anne Stewart, 561, 569
Youmans, Guy P., 561, 569
Young, Helen N., 145

Zalokar, Marko, 191
ZoBell, Claude E., 747, 771

INDEX OF SUBJECTS

Acetate production from fatty acids by *Neurospora*, 185
Acetone, growth inhibition of *Aerobacter aerogenes* by, 369
— metabolism by *Rhodopseudomonas gelatinosa*, 595
Achromobacter fischeri, large body production by, 279
Actidione, control of mold contaminants by, 104
Aerobacter aerogenes, inhibition of growth of, 369
Alanine, effect on variation in *Brucella abortus* of, 291
Alcohols, growth inhibition of *Aerobacter aerogenes* by, 369
Aliphatic acids, effect on activity of antibacterial agents, 269
Amino acid deaminases, relation of coenzyme of, to biotin, 107
— acid requirements of *Clostridium sporogenes*, 39
— acids, effect on hydrogenase production by *Escherichia coli*, 311
— acids, oxidative dissimilation of, by *Brucella abortus*, 459
p-Aminobenzoic acid and the sulfonamide-requiring mutant of *Neurospora*, 191
Anaerobiosis and growth of *Treponema pallidum*, 5
Antibacterial agents, effect of aliphatic acids on, 269
Antibodies, immobilizing and spirocheticidal, against *Treponema pallidum*, 473
Arginine replacement in nutrition of *Clostridium sporogenes*, 39
Artifacts and filamentous forms of influenza and fowl pest viruses, 129
L-Aspartic acid interference with pantothenate synthesis in *Escherichia coli*, 733
Assay for growth, rapid, 249
Assays, turbidimetric-titrimetric disparity in, 215
Assimilation and energetics in the combustion of carbon compounds by *Escherichia coli*, 585
Aureomycin, effect on *Erysipelothrix rhusiopathiae* of, 139
—, oral, intravenous, and intramuscular, and correlation between *in vivo* and *in vitro* activity, 159
Azotobacter agile, large bodies of, 525

Bacillus anthracis, synthesis of glutamic acid and glutamyl polypeptide by, 89
Bacteria, effect of heparin on growth of, 171
—, effect of X-rays on, 263
Bacteriophage, effect on tryptophan utilization in *Escherichia coli* of, 69
—, multiplication of, affecting *Streptomyces griseus*, 29
—, T2, of *Escherichia coli*, 393
—, T2r$^+$, radioactive studies of phosphorus metabolism of, with *Escherichia coli*, 511
—, X-ray-inactivated, 667
— of lactic *Streptococcus*, relation of calcium to, 533
Bacterium cadaveris (Gale) and biotin, 107
Biotin and the coenzyme of certain amino acid deaminases, 107
— coenzyme, studies on, 485
— replacement in nutrition of *Clostridium sporogenes*, 39
Blastomyces dermatitidis, metabolism of, 333, 341
Bovine plasma fractions and growth of *Mycobacterium tuberculosis* var. *hominis*, 561
Brucella abortus, effect of ionic Mn and Mg on, 283
— *abortus*, effect of metabolites on growth and variation of, 291
— *abortus*, oxidative dissimilation of amino acids by, 459
Brucellae, cultivation of, on chemically defined media, 661
—, peptone toxicity for, 655
Butyribacterium rettgeri, new growth factor for, 349

Cadmium, interference of magnesium metabolism by, 401
Calcium and lactic *Streptococcus* bacteriophage, 533
Camphor, production of "giant" cells of *Pasteurella pestis* by treatment with, 102
Carbohydrate assimilation by *Escherichia coli*, energy relationships in, 573
Carbon compounds, energetics and assimilation in combustion of, by *Escherichia coli*, 585

Cells, ribonucleic acid content of, related to gram stain, 499
Chromatinic bodies of *Escherichia coli* and *Proteus vulgaris*, 81
Citrate utilization by *Escherichia coli*, 119
Clostridium bifermentans, nutritional requirements of, 9
— *perfringens*, migration of, in semisolid medium, 275
— *sporogenes*, biotin and arginine replacements in nutrition of, 39
Coagulase test for staphylococci in food poisoning, 481
Cobalt, interference of magnesium metabolism by, 401
Coenzyme, biotin, 485
— A, utilization of, by *Propionibacterium freudenreichii*, 757
— of amino acid deaminases and biotin, 107
Coliform bacteria, phenol production by, 101
Cystine and cysteine metabolism by *Proteus vulgaris* and *Proteus morganii*, 607
— oxidation and peptone toxicity for brucellae, 655
Cytology of avian strain of *Mycobacterium tuberculosis*, 423

Desoxyribosides required by lactic acid bacteria, 49
Desulfovibrio, hydrogen-utilizing, sulfate-reducing, 747

Electron microscope, *see* Microscope *and* Microscopy
Embryo, chick, growth of *Treponema pallidum* in, 5
Energetics and assimilation in the combustion of carbon compounds by *Escherichia coli*, 585
Energy relationships in carbohydrate assimilation by *Escherichia coli*, 573
Enterobacteriaceae, two intermediate members of, 367
Enterotoxin production by staphylococci, 481
Erwinia, nutritional requirements of, 669
Erysipelothrix rhusiopathiae, effects of aureomycin and penicillin on, 139
— *rhusiopathiae*, susceptibility of hamsters to, 677
Escherichia coli, chromatinic bodies of, 81
— *coli*, citrate utilization by, 119
— *coli*, effect of virus infection on tryptophan utilization by, 69
— *coli*, energetics and assimilation in the combustion of carbon compounds by, 585
— *coli*, energy relationships in carbohydrate assimilation by, 573
— *coli*, β-D-galactosidase of, 381
— *coli*, metabolic studies on T2 bacteriophage of, 393
— *coli*, mutants of, requiring methionine or vitamin B_{12}, 17
— *coli*, nonfiltrability of agents of genetic recombination of, 507
— *coli*, nuclear sites in metal-shadowed cells of, 635
— *coli*, nutritional requirements for hydrogenase production by, 311
— *coli*, oxidative assimilation of glucose by, 113
— *coli*, radioactive studies of phosphorus metabolism of T2r$^+$ bacteriophage with, 511
— *coli*, D-serine and L-aspartic acid interference in pantothenate synthesis by, 733
— *coli*, sulfur metabolism in, 233
— *coli* B, "fixation" of specimens of, for electron microscopy, 641
Ethyl acetate, growth inhibition of *Aerobacter aerogenes* by, 369

Fatty acid oxidation by *Neisseria catarrhalis*, 627
— acids, acetate production from, by *Neurospora*, 185
Fecal bacteria of mice and mouse encephalomyelitis virus, 175
Filamentous forms of influenza and fowl pest viruses, 129
"Fixation" of electron microscopic specimens by electron beam, 641
Flagellation of spirochetes, 678
Flat sour organisms, spore formation by, 205
Food poisoning, coagulase test for staphylococci in, 481
Fowl pest virus, 129
Fungi in animal tissue, periodic-acid-Schiff stain for, 415
Fungistatic activity, determination of, 249

β-D-Galactosidase of *Escherichia coli*, 381
Genetic recombination in *Escherichia coli*, nonfiltrability of agents of, 507

Glucose, oxidative assimilation of, by *Escherichia coli*, 113
Glucose metabolism by *Streptococcus faecalis*, influence of pyruvate oxidative factor in, 449
Glutamic acid, synthesis of, by *Bacillus anthracis*, 89
Glutamine and growth of Reiter treponeme, 57
Glutamyl polypeptide, synthesis of, by *Bacillus anthracis*, 89
Gram stain and ribonucleic acid content of cells, 499
Growth, rapid assay for, 249
— factor required by *Butyribacterium rettgeri*, 349
— inhibition by D-serine and L-aspartic acid in *Escherichia coli*, 733
— inhibition of *Aerobacter aerogenes*, 369
— of bacteria and yeasts, effect of heparin on, 171
— of *Clostridium bifermentans*, 9
— of *Neurospora*, phase corresponding to logarithmic growth in, 221
— of Reiter treponeme in chick embryo, 5

Hamsters, susceptibility of, to *Erysipelothrix rhusiopathiae*, 677
Hemagglutination inhibition activity of Newcastle disease immune sera, 557
Heparin, effect on bacteria and yeasts of, 171
Hotchkiss-McManus stain, 415
Hydrogen-utilizing, sulfate-reducing marine bacteria, 747
Hydrogenase production by *Escherichia coli*, nutritional requirements for, 311
Hydrostatic pressure, effect on marine bacteria of, 771

Influenza virus, 129
— virus, adapted and unadapted, in mouse lung, 489
Ion antagonisms in microorganisms, 401

Lactic acid bacteria, nutritional requirements of, 49
Lactobacilli from turkeys, 543
Lactobacillus arabinosus, tyrosine-independent strains of, 719
— *bifidus*, branched and unbranched strains of, 681
— *casei*, turbidimetric-titrimetric disparity in oleic acid stimulation of, 215
Lag phase in growth of *Aerobacter aerogenes*, factors influencing, 369
Large bodies of *Azotobacter agile*, 525
— body production by luminous bacteria, influence of penicillin on, 279
Leishmania tropica, structure of, 617
Luminous bacteria, influence of penicillin on large body production by, 279

Magnesium, interference with metabolism of, by other trace elements, 401
—, ionic, effect on *Brucella abortus* of, 283
Manganese, interference of magnesium metabolism by, 401
—, ionic, effect on *Brucella abortus* of, 283
Marine bacteria, effects of hydrostatic pressure on, 771
Media, chemically defined, for brucellae, 661
—, control of mold contaminants on, 104
—, liquid, for recently isolated strains of *Mycobacterium tuberculosis* var. *hominis*, 569
—, synthetic, for sulfur metabolism of *Escherichia coli*, 234
— for genus *Erwinia*, 669
Medium, Koser's citrate, for *Escherichia coli*, 119
—, relation between constituents of, and bacteriophage in lactic *Streptococcus*, 533
—, semisolid, for study of *Clostridium perfringens* migration, 275
—, synthetic, for *Butyribacterium rettgeri*, 349
—, synthetic, for growth and variation of *Brucella abortus*, 291
—, synthetic, for growth of *Clostridium bifermentans*, 9
— for development of tyrosine-independent strains of *Lactobacillus arabinosus*, 719
— for growth of *Mycobacterium tuberculosis* var. *hominis*, 561
— for hydrogenase production by *Escherichia* coli, 311
— for streptolysin O formation by hemolytic Streptococcus, 301
Metabolism of acetone by *Rhodopseudomonas gelatinosa*, 595
— of *Blastomyces dermatitidis*, 333, 341
— of cystine and cysteine by *Proteus vulgaris* and *Proteus morganii*, 607
— of T2 *Escherichia coli* bacteriophage, 393
Metabolites, effect on variation in *Brucella abortus* of, 291

Methionine, *Escherichia coli* mutants requiring, 17
— -threonine antagonism in *Neurospora*, 191
Microbiological susceptibility, determination of, 249
Microscope, electron, studies of artifacts and influenza and fowl pest viruses, 129
—, electron and light, studies on cytology of *Mycobacterium tuberculosis* with, 423
—, phase contrast, demonstration of chromatinic bodies in *Escherichia coli* and *Proteus vulgaris* by, 81
Microscopy, electron, "fixation" of specimens for, by electron beam, 641
—, electron and light, of bacterial nuclei, 635
—, phase and electron, structure of *Leishmania tropica* revealed by, 617
Mold contaminants, control of, with actidione, 104
Morphology of sulfonamide-susceptible and resistant *Staphylococcus aureus*, 315
Motility of *Clostridium perfringens*, 275
Mouse encephalomyelitis virus, 175
— lung, adapted and unadapted influenza virus in, 489
Mutants, smooth, method for separation of, 366
— of *Brucella abortus*, effect of ionic Mn and Mg on, 283
— of *Thiobacillus thiooxidans*, 509
Mutations, auxotrophic, in *Salmonella typhimurium*, and X-ray dosage, 145
Mycobacterium tuberculosis, avian strain, cytology of, 423
— *tuberculosis* var. *hominis*, growth of recently isolated strains in liquid media, 569
— *tuberculosis* var. *hominis*, *in vitro* effect of vitamin K analogs on, 469
— *tuberculosis* var. *hominis* and bovine plasma fractions, 561

Naphthalene acetic acid, virus inhibition by, 763
Neisseria catarrhalis, fatty acid metabolism by, 627
Neurospora, acetate production from fatty acids by, 185
—, growth phase corresponding to logarithmic growth, 221
—, sulfonamide-requiring mutant of, 191
Newcastle disease immune sera, antiviral activity of, 557
Nickel, interference of magnesium metabolism by, 401
Nitrate reduction by microorganisms, microtechnique for, 365
Nuclear cytology of vegetative diplophase of *Saccharomyces cerevisiae*, 321
Nuclease production by streptococci, 673
Nuclei, bacterial, electron and light microscopic studies of, 635
Nucleic acid synthesis by *Escherichia coli* infected with bacteriophage, 511
Nutrient concentration, effect of, on spore formation by flat sour organisms, 205
Nutrition, effect of, on streptolysin O formation, 301
— of *Clostridium sporogenes*, biotin and arginine replacements in, 39
Nutritional requirements for hydrogenase production by *Escherichia coli*, 311
— requirements of brucellae, 661
— requirements of *Clostridium bifermentans*, 9
— requirements of lactic acid bacteria, 49
— requirements of phytopathogenic bacteria, 669
— requirements of treponemata, 57

Oleic acid stimulation of *Lactobacillus casei*, turbidimetric-titrimetric disparity in, 215
Oxalacetate decarboxylase system, relation of biotin coenzyme to, 485
Oxidation of cystine and peptone toxicity for brucellae, 655
— of fatty acids by *Neisseria catarrhalis*, 627
Oxidative assimilation of glucose by *Escherichia coli*, 113
— dissimilation of amino acids by *Brucella abortus*, 459
— metabolism of *Streptococcus faecalis*, influence of pyruvate oxidative factor on, 449
Oxygen consumption as indication of growth, 249

Pantothenate synthesis in *Escherichia coli*, interference by D-serine and L-aspartic acid, 733
Pantothenic acid and coenzyme A, 757
— acid and growth of Reiter treponeme, 57
Pasteurella pestis, detection of rough dissociants of, with tetrazolium chloride, 508
— *pestis*, "giant" cells of, 102

Penicillin, effect on *Erysipelothrix rhusiopathiae* of, 139
—, influence of, on large body production by luminous bacteria, 279
— -screened auxotrophic mutations in *Salmonella typhimurium* and X-ray dosage, 145
Peptone toxicity for brucellae, 655
Periodic-acid-Schiff stain for fungi in animal tissue, 415
pH, effect of, on respiration of *Blastomyces dermatitidis*, 341
Phenol production by coliform bacteria, 101
Phenols, growth inhibition of *Aerobacter aerogenes* by, 369
Phenylalanine and growth of Reiter treponeme, 57
Phenylpyruvic acid reaction and the urease test for *Proteus*, 225
Phosphorus, radioactive, in metabolism of T2r$^+$ bacteriophage with *Escherichia coli*, 511
Photosynthetic bacterium, acetone metabolism by, 595
Phytopathogenic bacteria, nutrition of, 669
Plasma fractions, bovine, and *Mycobacterium tuberculosis* var. *hominis*, 561
Propionibacterium freudenreichii, utilization of coenzyme A by, 757
Proteus, phenylpyruvic acid reaction and urease test for differentiation of, 225
— *morganii*, cystine and cysteine metabolism by, 607
— *vulgaris*, chromatinic bodies of, 81
— *vulgaris*, cystine and cysteine metabolism by, 607
Pseudomonas aeruginosa, sarcosine oxidase in, 767
Pyruvate oxidation factor, influence on metabolism of glucose by *Streptococcus faecalis*, 449

Radioactive phosphorus in metabolism of T2r$^+$ bacteriophage with *Escherichia coli*, 511
— sulfur in *Escherichia coli*, 233
Reducing agents, effect on streptolysin O formation, 301
Respiration of *Blastomyces dermatitidis*, 333, 341
Rhodopseudomonas gelatinosa, acetone metabolism by, 595
Ribonucleic acid and gram staining, 499

Saccharomyces cerevisiae, 107
— *cerevisiae*, nuclear cytology of vegetative diplophase of, 321
Salmonella emek, 213
— *haifa*, 101
— *typhimurium*, auxotrophic mutations of, 145
Salts, effect on spore formation by flat sour organisms, 205
Sarcosine oxidase in *Pseudomonas aeruginosa*, 767
D-Serine interference with pantothenate synthesis in *Escherichia coli*, 733
Serum-neutralizing activity against Newcastle disease virus, 557
Smooth bacterial types, method for separation of, 366
Spectrophotometric method for determination of tobacco mosaic virus concentration, 763
Spirochetes, flagellation of, 678
—, growth of, in chick embryo, 5
Spore formation by thermophilic flat sour organisms, 205
Stain, periodic-acid-Schiff, for fungi in animal tissue, 415
Staphylococci in food poisoning, coagulase test for, 481
Staphylococcus aureus, sulfonamide-susceptible and resistant strains of, 315
Streptococci, nuclease production by, 673
Streptococcus, hemolytic, formation of streptolysin O by, 301
— *cremoris*, relationship of medium to bacteriophage in, 533
— *faecalis*, influence of pyruvate oxidation factor in, 449
— *lactis*, relationship of medium to bacteriophage in, 533
Streptolysin O, formation of, by group A hemolytic Streptococcus, 301
Streptomyces griseus, multiplication of phages affecting, 29
Streptomycin, effect of aliphatic acids on, 269
—, effect on *Erysipelothrix rhusiopathiae* of, 139
— production, effect of phages on, 29
Substrate, significance of molecular structure of, in synthesis of cell materials, 573, 585
Succinic acid decarboxylase system, relation of biotin coenzyme to, 485

Sulfate-reducing, hydrogen-utilizing marine bacteria, 747
Sulfonamide-requiring mutant of *Neurospora* and threonine-methionine antagonism, 191
— -susceptible and resistant strains of *Staphylococcus aureus*, 311
Sulfur metabolism in *Escherichia coli*, 233

Tetrazolium chloride for detection of rough dissociants of *Pasteurella pestis*, 508
Thiobacillus thiooxidans, mutants of, 509
Threonine-methionine antagonism in *Neurospora*, 191
Tobacco mosaic virus, inhibition of, by naphthalene acetic acid, 763
Trace elements, ion antagonism in, 401
Transamination, formation of glutamic acid by, in *Bacillus anthracis*, 89
Treponema carateum, electron microscope studies of, 129
— *pallidum*, Reiter strain, growth of, 57
— *pallidum*, Reiter strain, growth of in chick embryo, 5
— *pallidum*, relationship between immobilizing and spirocheticidal antibodies against, 473
Treponemata, nutritional requirements of, 57
Tryptophan utilization by *Escherichia coli*, effect of virus infection on, 69
Turkeys, lactobacilli from, 543
Tyrosine-independent strains of *Lactobacillus arabinosus*, 719

Ultraviolet exposure, effect on phosphorus metabolism of *Escherichia coli* infected with bacteriophage, 511
Urease test and phenylpyruvic acid reaction for *Proteus*, 225

Variation in *Brucella abortus*, effect of ionic Mn and Mg on, 283
— in *Brucella abortus*, effect of metabolites on, 291
Virus, influenza, in mouse lung, 489
—, mouse encephalomyelitis, 175
— -multiplication inhibition by naphthalene acetic acid in tobacco tissue cultures, 763
— -neutralizing activity of Newcastle disease immune sera, 557
Viruses, influenza and fowl pest, and artifacts, 129
—, *see also* Bacteriophage
Vitamin B_{12}, *Escherichia coli* mutants requiring, 17
— B_{12}, lactic acid bacteria requiring, 49
— K analogs, *in vitro* effect of, on *Mycobacterium tuberculosis* var. *hominis*, 469
— requirements of *Clostridium sporogenes*, 39

X-ray dosage and auxotrophic mutations of *Salmonella typhimurium*, 145
— -inactivated bacteriophage, 697
X-rays, effects on bacteria of, 263

Yeasts, effect of heparin on growth of, 171

Zinc, interference of magnesium metabolism by, 401

JOURNAL

OF

BACTERIOLOGY

VOLUME 60

BALTIMORE, MD.
1950

CONTENTS

No. 1, JULY, 1950

Arthur Parker Hitchens: 1877–1949. Claude P. Brown 1

The Growth of the Reiter Strain of *Treponema pallidum* in the Chick Embryo. William B. Beardmore and Matt C. Dodd 5

Factors Necessary for Maximum Growth of *Clostridium bifermentans*. Louis DeSpain Smith and Howard C. Douglas 9

Mutants of *Escherichia coli* Requiring Methionine or Vitamin B_{12}. Bernard D. Davis and Elizabeth S. Mingioli 17

Observations on the Multiplication of Phages Affecting *Streptomyces griseus*. Walter L. Koerber, George Greenspan, and A. F. Langlykke 29

Biotin and Arginine Replacements in the Nutrition of *Clostridium sporogenes*. Richard W. Thoma and W. H. Peterson 39

Some Additional Nutritional Requirements of Certain Lactic Acid Bacteria. Estelle Kitay and Esmond E. Snell 49

Nutritional Requirements of Treponemata. II. Pantothenic Acid, Glutamine, and Phenylalanine as Additional Growth-promoting Factors for the Reiter Treponeme. Harry G. Steinman and Harry Eagle 57

The Effect of Virus Infection on the Utilization of Tryptophan by *Escherichia coli*. Ruth N. Raff and Seymour S. Cohen 69

Demonstration of the Chromatinic Bodies of *Escherichia coli* and *Proteus vulgaris* with the Aid of the Phase Contrast Microscope. Henry Stempen 81

Synthesis of Glutamic Acid and Glutamyl Polypeptide by *Bacillus anthracis*. I. Formation of Glutamic Acid by Transamination. Riley D. Housewright and Curtis B. Thorne 89

Notes:

A New *Salmonella* Type: *Salmonella haifa*. Raya Sapiro and Willy Hirsch 101

Phenol Production by Coliform Bacteria. O. B. Williams and Jack D. English 101

The Production of "Giant" Cells of *Pasteurella pestis* by Treatment with Camphor. William D. Won 102

Control of Mold Contaminants on Solid Media by the Use of Actidione. G. Briggs Phillips and Everett Hanel, Jr. 104

No. 2, AUGUST, 1950

The Relationship of Biotin to the Coenzyme of Certain Amino Acid Deaminases. John F. Christman and Herman C. Lichstein 107

Oxidative Assimilation of Glucose by *Escherichia coli*. Benjamin V. Siegel and C. E. Clifton 113

The Utilization of Citrate by *Escherichia coli*. Reese H. Vaughn, Joel T. Osborne, George T. Wedding, Joseph Tabachnick, C. Gordon Beisel, and Thelma Braxton 119

Artifacts, with Other Nonspecific Appearances Resembling Virus Particles, and the So-called Filamentous Forms of Influenza and Fowl Pest Viruses in Human Skin Tissue Fluid Examined with the Electron Microscope. Juan J. Angulo, John H. L. Watson, and Jorge Olarte 129

The Effects of Aureomycin and of Penicillin against *Erysipelothrix rhusiopathiae in Vitro* and *in Vivo*. J. E. Prier and J. O. Alberts 139

Penicillin-screened Auxotrophic Mutations in *Salmonella typhimurium* and Their Relation to X-Ray Dosage. H. H. Plough, Helen N. Young, and Madelon R. Grimm 145

Evaluation of Oral, Intravenous, and Intramuscular Aureomycin and the Correlation between the *in Vivo* and *in Vitro* Activity. Morton Klein, Sonia E. Schorr, Sylvia Tashman, and Andrew D. Hunt, Jr. 159

The Effect of Heparin on the Growth of Bacteria and Yeasts. John R. Warren and Fredrick Graham 171
Investigations of the Fecal Bacteria of Mice, with Reference to the Presence of Mouse Encephalomyelitis Virus. Myrtle Shaw and Gilbert Dalldorf 175
The Production of Acetate from Fatty Acids by *Neurospora*. Joseph Lein and Patricia S. Lein 185
The Sulfonamide-requiring Mutant of *Neurospora*: Threonine-Methionine Antagonism. Marko Zalokar 191
Spore Formation by Thermophilic Flat Sour Organisms. I. The Effect of Nutrient Concentration and the Presence of Salts. Clarence F. Schmidt 205
Note:
A New *Salmonella* Type: *Salmonella emek*. W. Hirsch, E. Henig, and R. Sapiro 213

No. 3, SEPTEMBER, 1950

Turbidimetric-titrimetric Disparity in Oleic Acid Stimulation of *Lactobacillus casei*. Virginia R. Williams and E. Anne Andrews 215
The Growth Phase in *Neurospora* Corresponding to the Logarithmic Phase in Unicellular Organisms. Sterling Emerson 221
A Comparison of the Phenylpyruvic Acid Reaction and the Urease Test in the Differentiation of *Proteus* from Other Enteric Organisms. Sverre Dick Henriksen 225
Sulfur Metabolism in *Escherichia coli*. I. Sulfate Metabolism of Normal and Mutant Cells. Dean B. Cowie, Ellis T. Bolton, and Margot K. Sands 233
Rapid Assay for Growth: Determination of Microbiological Susceptibility and Fungistatic Activity. G. R. Mandels and R. G. H. Siu 249
Effects of X-Rays Produced at 50 Kilovolts on Different Species of Bacteria. Harvey Fram, Bernard E. Proctor, and Cecil G. Dunn 263
The Effect of Aliphatic Acids on the Activity of Certain Antibacterial Agents. John Hays Bailey and Chester J. Cavallito 269
The Migration of Cultures of *Clostridium perfringens* in Semisolid Medium. James W. Mandia 275
The Influence of Penicillin on Large Body Production by Luminous Bacteria. Warren W. Warbasse and Frank H. Johnson 279
The Effect of Ionic Mn and Mg on the Variation of *Brucella abortus*. Leonard J. Cole and Werner Braun 283
The Effect of Metabolites upon Growth and Variation of *Brucella abortus*. Robert J. Goodlow, Leonard A. Mika, and Werner Braun 291
Nutrition and the Role of Reducing Agents in the Formation of Streptolysin O by a Group A Hemolytic Streptococcus. Hutton D. Slade and Grace A. Knox 301
Nutritional Requirements for Hydrogenase Production by *Escherichia coli*. Daniel Billen and Herman C. Lichstein 311
The Morphological Characteristics of Paired Sulfonamide-susceptible and Sulfonamide-resistant Strains of *Staphylococcus aureus*. Mary Elizabeth Hunter, Stuart Mudd, and Marcia A. Woodburn 315
The Nuclear Cytology of the Vegetative Diplophase of *Saccharomyces cerevisiae*. Edward D. DeLamater 321
Studies on the Metabolism of *Blastomyces dermatitidis*. I. The Effect of various Substances on Respiration. Seymour Levine and Milan Novak 333
Studies on the Metabolism of *Blastomyces dermatitidis*. II. The Effect of pH on Respiration. Seymour Levine and Milan Novak 341
A New Growth Factor Required by *Butyribacterium rettgeri*. Leo Kline and H. A. Barker 349
Notes:
A Rapid Microtechnique for the Determination of Nitrate Reduction by Microorganisms. Franklin K. Brough 365

A Simple Method for the Automatic Separation of Smooth Bacterial Types from Mixed Populations. Werner Braun and E. Virgil Howell 366
Two Intermediate Members of *Enterobacteriaceae*. William H. Ewing and Martha C. Hucks 367

No. 4, October, 1950

Inhibition of Growth of *Aerobacter aerogenes*: The Mode of Action of Phenols, Alcohols, Acetone, and Ethyl Acetate. S. Dagley, E. A. Dawes, and G. A. Morrison 369
The *beta*-D-Galactosidase of *Escherichia coli*, Strain K-12. Joshua Lederberg 381
Metabolic Studies on T2 *Escherichia coli* Bacteriophage. Samuel J. Ajl 393
Ion Antagonisms in Microorganisms: Interference of Normal Magnesium Metabolism by Nickel, Cobalt, Cadmium, Zinc, and Manganese. Philip H. Abelson and Elaine Aldous 401
The Periodic-Acid-Schiff Stain for the Demonstration of Fungi in Animal Tissue. Albert M. Kligman and Herbert Mescon 415
The Cytology of an Avian Strain of *Mycobacterium tuberculosis* Studied with the Electron and Light Microscopes. Georges Knaysi, James Hillier, and Catherine Fabricant 423
Influence of the Pyruvate Oxidation Factor on the Oxidative Metabolism of Glucose by *Streptococcus faecalis*. D. J. O'Kane 449
The Oxidative Dissimilation of Amino Acids and Related Compounds by *Brucella abortus*. Philipp Gerhardt, H. B. Levine, and J. B. Wilson 459
The *in Vitro* Effect of Analogs of Vitamin K on *Mycobacterium tuberculosis* var. *hominis*, Strain H37Rv. Alexander Kimler 469
The Relationship between Immobilizing and Spirocheticidal Antibodies against *Treponema pallidum*. Frederick A. Thompson, Jr., Bernard G. Greenberg, and Harold J. Magnuson 473
Evaluation of the Coagulase Test in the Study of Staphylococci Associated with Food Poisoning. James B. Evans, L. G. Buettner, and C. F. Niven, Jr. 481
Further Studies on the Biotin Coenzyme. Herman C. Lichstein 485
The Relation of the Concentration of Unadapted and Adapted Influenza Virus in the Mouse Lung to the Death or Survival of the Infected Host. John Y. Sugg 489
The Relation of the Gram Stain to the Cell Wall and the Ribonucleic Acid Content of the Cell. Carl Lamanna and M. F. Mallette 499
Notes:
Nonfiltrability of the Agents of Genetic Recombination in *Escherichia coli*. Bernard D. Davis 507
Detection of Rough Dissociants of *Pasteurella pestis* with Tetrazolium Chloride. H. B. Levine and E. D. Garber 508
Induced Mutants of *Thiobacillus thiooxidans* Requiring Organic Growth Factors. Sydney C. Rittenberg and Robert P. Grady 509

No. 5, November, 1950

Radioactive Studies of the Phosphorus Metabolism of T2r$^+$ Bacteriophage with *Escherichia coli*. Louis W. Labaw, Vernon M. Mosley, and Ralph W. G. Wyckoff 511
A Study of Large Bodies in *Azotobacter agile*. A. Eisenstark, C. B. Ward, Jr., and T. S. Kyle 525
The Relation of Calcium and Other Constituents of a Defined Medium to Proliferation of Lactic Streptococcus Bacteriophage. E. B. Collins, F. E. Nelson, and C. E. Parmelee 533
Lactobacilli from Turkeys. Arthur P. Harrison, Jr., and P. Arne Hansen 543
The Antiviral Activity of Newcastle Disease Immune Sera. R. P. Hanson, Nancy S. Winslow, C. A. Brandly, and Elizabeth Upton 557

The Effect of Bovine Plasma Fractions on the Growth of *Mycobacterium tuberculosis* var. *hominis*. Anne Stewart Youmans and Guy P. Youmans 561
The Growth of Recently Isolated Strains of *Mycobacterium tuberculosis* var. *hominis* in Liquid Media. Guy P. Youmans and Anne Stewart Youmans 569
Energy Relationships in Carbohydrate Assimilation by *Escherichia coli*. Benjamin V. Siegel and C. E. Clifton 573
Energetics and Assimilation in the Combustion of Carbon Compounds by *Escherichia coli*. Benjamin V. Siegel and C. E. Clifton 585
The Metabolism of Acetone by the Photosynthetic Bacterium *Rhodopseudomonas gelatinosa*. Jack M. Siegel 595
The Metabolism of Cystine and Cysteine by *Proteus vulgaris* and *Proteus morganii*. R. E. Kallio and J. R. Porter 607
The Structure of *Leishmania tropica* as Revealed by Phase and Electron Microscopy. Ruth Lofgren 617
The Oxidation of Fatty Acids by *Neisseria catarrhalis*. Chester I. Randles 627
Electron and Light Microscopic Studies of Bacterial Nuclei. III. The Nuclear Sites in Metal-shadowed Cells of *Escherichia coli*. Stuart Mudd, Andrew G. Smith, James Hillier, and Ernst H. Beutner 635
The "Fixation" of Electron Microscopic Specimens by the Electron Beam. James Hillier, Stuart Mudd, Andrew G. Smith, and Ernst H. Beutner 641
The Development of Peptone Toxicity for Brucellae with Aging and the Correlation of This Toxicity with the Probable Oxidation of Cystine. V. T. Schuhardt, L. J. Rode, Glenda Oglesby, and C. E. Lankford 655
The Cultivation of Brucellae on Chemically Defined Media. L. J. Rode, Glenda Oglesby, and V. T. Schuhardt 661
The Nutrition of Phytopathogenic Bacteria. IV. Minimal Nutritive Requirements of the Genus *Erwinia*. Mortimer P. Starr and Manley Mandel 669
A Survey of Nuclease Production by Streptococci. Albert L. Brown 673
Notes:
The Susceptibility of Hamsters to *Erysipelothrix rhusiopathiae*. R. D. Shuman and A. M. Lee 677
The Flagellation of Spirochetes. Einar Leifson 678

No. 6, DECEMBER, 1950

The Isolation and Cultivation of *Lactobacillus bifidus*: A Comparison of Branched and Unbranched Strains. Robert F. Norris, Thelma Flanders, R. M. Tomarelli, and Paul György 681
The Properties of X-Ray-inactivated Bacteriophage. I. Inactivation by Direct Effect. James Dewey Watson 697
The Development of Tyrosine-independent Strains of *Lactobacillus arabinosus*. A. P. James 719
Pantothenate Studies. I. Interference by D-Serine and L-Aspartic Acid with Pantothenate Synthesis in *Escherichia coli*. Werner K. Maas and Bernard D. Davis 733
Hydrogen-utilizing, Sulfate-reducing Bacteria in Marine Sediments. Frederick D. Sisler and Claude E. ZoBell 747
Utilization of Coenzyme A by *Propionibacterium freudenreichii*. A. G. Moat and Eugene A. Delwiche 757
Inhibition of Virus Multiplication by Naphthalene Acetic Acid in Tobacco Tissue Cultures As Revealed by a Spectrophotometric Method. R. J. Kutsky and T. E. Rawlins 763
The Sarcosine Oxidase in Adapted and Unadapted Cultures of a Strain of *Pseudomonas aeruginosa*. Frederick Bernheim 767
Some Effects of Hydrostatic Pressure on the Multiplication and Morphology of Marine Bacteria. Claude E. ZoBell and Carl H. Oppenheimer 771
Index of Authors 783
Index of Subjects 785